



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ENTOMOLOGIA HONGKONGENSIS—REPORT ON THE LEPIDOPTERA OF HONGKONG.

BY F. WARRINGTON EASTLAKE.

The province of Kwangtung, to which the island of Hongkong properly belongs, has long been celebrated throughout the Chinese Empire for the beauty and great variety of the insects to be found within its borders. The soil is, in most parts, exceptionally rich, and teems with an ever-busy world of animal life. But, great as is the fecundity of the larger part of the province, there are, here and there, sandy, arid wastes, which even the untiring labor of the native agriculturists fails to make yield more than the scantiest of crops. This is especially the case along the southeastern littoral. Here the formation is igneous and the rocks granitic, as a rule, with occasional intrusive traps and seams of trachytic porphyry. The island of Hongkong, in particular, consists mainly of hornblendic granite, of which silica, alumina, and various oxides of iron are the principal components. The rock is, at the same time, composed throughout of materials unusually susceptible to climatic influences, particularly to the action of heavy rains. The decomposed and disintegrated rock makes an admirably fertile soil, especially in the ravines, valleys, and lowlands; the hills, however, being constantly exposed to all sorts of weather, are signally barren and verdureless. Tufts of "arrow-grass," long, trailing mosses, coarse ferns and hardy flowering-plants are sparsely scattered over the mountain-slopes; pines, firs, and a few other resinous trees cover the less-exposed portions, but the heavy rains annually sweep down quantities of this local vegetation into the sea. In such places insect life is rare. And yet the entomology of Hongkong, although so small an island, is unusually rich and worthy of attention. This is chiefly due to the fact that the island is connected with the famous Lo-fan Shan—a small range of mountains some fifteen miles north of the thriving market-town of *Shek Lung* ("Stone Dragon,") and about seventy miles east of Canton. Starting from the westernmost spur of this range, a limestone formation runs to the north and northwest. Here the flora is both beautiful and luxuriant; flowering plants laden with tempting pollen cover the hillsides,

and insects find in the verdant groves a veritable paradise. The Lo-fan Mountains besides this, probably owing to their majestic scenery and rich flora, have for more than ten centuries enjoyed a reputation of great sanctity. In the deep caves and mountain forests of the Lo-fan, hermits, sages and priests have lived and taught their disciples from time immemorial; while, in accordance with both Buddhistic and Taoistic precepts, all animals, birds, reptiles, insects, and even the delicious trout of the mountain-streams have been kept from harm and allowed to breed undisturbed. Passing through the thickly populated districts of Pok-lo and Tong-kun, a low, undulating range of hills connects the Lo-fan with the mountainous country opposite Hongkong. And hence it comes that the entomology of the island is so extensive and varied.

Hongkong lies between $22^{\circ} 9'$ and $22^{\circ} 1'$ north latitude, and $114^{\circ} 5'$ and $114^{\circ} 18'$ east longitude; the island is, therefore, just inside the tropics, but near enough to the boundary to enjoy fine, temperate weather from September to April. To a considerable extent, the insular fauna shows close relationship with the fauna of the tropics; and yet there can be no doubt that some few of the tropical features are not characteristic of Hongkong. To this category belong notably *Python reticulatus*, Gray, the rock python of India, and the venomous cobra, *Naja tripudians*, Merr.; very possibly, also *Macrochlamys superlita*, Morelet—a fine land snail. The Lepidoptera, however, are very distinctly related to the entomic fauna of the Himalayas, East India, and the Malayan Archipelago. During a stay of several years in Hongkong, the writer devoted much time and attention to the study of the insular fauna, and formed large collections of the lepidoptera and terrestrial mollusks. In the spring of 1883, the writer published a work on Hongkong, in which a short list of the diurnal Lepidoptera was given. But this list was necessarily incomplete, as the writer had not enjoyed any opportunity of subjecting his collections to competent scientific inspection and classification. Since then, thanks to several important works which have appeared on the Insect Fauna of various parts of Asia, the writer has been enabled to compile the following list in a far more thorough manner. Outside of Donovan's "Insects of China"—which will be mentioned later on—no work has ever been published on the entomology of China, and, beyond a few chapters in the

journals of passing naturalists, the enumeration and description of the Hongkong insects have been entirely neglected. Despite this fact, a rich field there awaits the collector and the scientist, as the beetles, butterflies and moths are often of exceptional size and great beauty. An *Attacus* (male) in the writer's possession measures no less than eleven and one-half inches across the wings. Of beetles alone—according to Frauenfeld—Mr. John Bowring (son of Governor Bowring, of Hongkong), collected more than twelve hundred species, many of which were new to science.

In compiling the following list, the entomology of various other localities throughout the province of Kwangtung has been taken into special consideration. Notably that of the other islands in the Ladrones group of the Lo-fan Mountains—where some time was spent in collecting—and of Macao. In the latter port the writer passed several months, and succeeded in making valuable collections, thanks to the courtesy of Governor da Graça, who did everything in his power to facilitate the work. A complete catalogue and description of the collections then made have since been embodied in a work entitled "*Fauna Macanensis*," recently forwarded to the Portuguese Government. It is somewhat difficult to keep the entomology of Hongkong entirely distinct from that of adjacent islands and mainland. As has already been stated, the hills opposite Hongkong practically introduce the insect fauna of the entire Kwangtung Province. At times, months or even years may pass before the reappearance of a certain species; and then a favorable wind may waft it unexpectedly into the flower-gardens of Victoria, there, mayhap, to completely puzzle the brains of some ardent entomologist. In the following list, however, all doubtful species have been so far as possible excluded, and only such admitted as have been identified by scientists of acknowledged ability.

Reference has been made to the following works:—

- Donovan, A. *The Insects of China*, 2d ed., 1842 (Westwood).
Frauenfeld. *Die Novara Expedition*, Sitzungsber. d. mathem. naturw. Cl. K. K. Acad. d. Wissensch., Wien, xxxv, 1859, 10.
Butler, A. *Lepidoptera Heterocera in the British Museum*, Pts. ii, iii, 1878.
Elwes, H. J. *Butterflies of Amurland, North China and Japan*. Proc. Zoolog. Soc. London, 1881.

Distant, W. L. *Rhopalocera Malayana*, Pts. i-v, London and Penang, 1882.

Pryer, H. A Catalogue of the Insects of Japan, Trans. Asiatic Soc. of Japan, 1883.

Donovan's "Insects of China" is a mere primer on the vast subject included in its title, and very incorrect at that. Since his day, entomological nomenclature has undergone many changes, and even the classification of genera and species has not been left undisturbed. For the sake of completeness, however, it is perhaps advisable to append the meagre list of Lepidoptera, which Donovan notes as coming from Hongkong. It includes but fifteen butterflies and four moths:—

Papilio paris, Linn.
Papilio agenor, Linn.
Papilio agamemnon, Linn.
Papilio epius, Jones.
Papilio demetrius, Linn.
Pieris hyparete, Linn.
Pieris (Iphia) glaucippe, Linn.
Pieris (Thestias) pyrene, Linn.
Argynnis eurymanthus, Drury.
Cynthia orithya, Linn.
Cynthia anone, Linn.

Cynthia almana, Linn.
Limenitis leucothoe, Linn.
Limenitis eurynome, Linn.
Thecla mæcenus, Jones.
Sesia hylas, Linn.
Glaucopsis polymena, Linn.
Phalæna attacus.
Saturnia atlas, Linn.
(Eusemia lectriz, Linn., doubtful.)

In Mr. H. J. Elwes' list I find further one butterfly mentioned as coming from Southern China, which I have never met with in Hongkong. This is *Thaumantis howgua*, Westwood, named probably after that rich Cantonese merchant so well known twenty or thirty years ago. Those marked with an asterisk (*) in the following list are contained in the writer's collection, but several others in this collection have still to be identified.

**Papilio xuthus*, Linn. (*xuthulus*, Linn.).

This insect occasionally finds its way to Hongkong, but is tolerably numerous around Canton and further north, and abundant in Japan. The imago invariably appears under the *xuthulus* form in the spring. The female is dimorphic, it feeds on various kinds of *Citrus*, especially *C. trifoliata*.

**Papilio maackii*, Men. (*Dehaani*, Feld.).

Very frequent in the Lo-fan Mountains; less so in Hongkong. Found also in North China and Japan.

***Papilio helenus**, Linn.

Rare ; has been taken also in Shanghai and Nagasaki.

***Papilio pamnon**, Linn.

This gorgeous butterfly is not uncommon about May, and continues to visit the island from time to time until September.

***Papilio memnon**, Linn.

This is one of the largest of the Hongkong Lepidoptera. The markings of the female are totally different from those of the male, which is altogether a smaller insect. Also Southern Japan.

***Papilio sarpedon**, Linn.

Quite common throughout the year. North China and Japan.

***Papilio demetrius**, Cramer.

Occasionally seen in autumn. Common in Japan.

***Papilio paris**, Linn.

Abundant. A beautiful insect, always to be found near *Hyliscus rosa sinensis*.

Papilio clytia, Linn. (var. *dissimilis*, Swainson).

***Papilio panope**, Linn.

Papilio polytes, Linn.

Papilio agenor**, Linn. (var. *alcanor*, Cramer).Papilio bianor**, Cramer.***Pieris rapæ**, Linn. (*crucivora*, Butler).

One of the commonest butterflies ; found all the year round. In markings and size it is very variable. As a rule, it feeds on cultivated *Cruciferæ*.

***Pieris napi**, Linn. (*megamera*, Butler ; *melete*, Men.),

Pieris canidia, Sparrm.

***Tereias multiformis**, H. Pryer (*Hecabe*, Linn. ; *mandarina*, De l'Orza ; *hecabeoides*, Men. ; *sinensis*, Sue ; *Mariesi*, Butler ; *anemone*, Felder ; *connexiva*, Butler ; *æsiopæ*, Mon. ; *sari*, Horsfield).

Thanks to the scientific investigation of Mr. H. Pryer, it is now demonstrated that this butterfly is found in nearly every country, and that the long list of varieties do not constitute special species, as most of them interbreed without difficulty. It is abundant throughout China and Japan.

Eurema blanda, Boisduval.

**Delias pasithoe*, Linn.

**Delias hierte*, Hübner.

**Lycæna bætica*, Linn.

**Lycæna lysimon*, Hübner.

Both of these are common throughout the greater part of the year.

**Neptis aceris*, Lep. (*intermedia*, Pryer).

Abundant, and very variable in size.

Vanessa charonia, Drury.

**Vanessa callirhoe*, Fabricius.

Quite common, but a very beautiful insect. Feeds on several *Urticaceæ*.

**Vanessa cardui*, Linn.

This butterfly has a very wide spread, and comes early in spring and stays throughout the summer. It is quite as abundant as the foregoing.

**Argynnis niphe*, Linn.

Not uncommon, but very local.

**Argynnis eurymanthus*, Drury.

**Melanitis leda*, Linn.

**Mycalesis gotama*, Moore.

**Mycalesis perseus*, Fabricius.

Mycalesis perseus, var. *visala*, Moore.

**Mycalesis igoleta*, Felder.

**Mycalesis medus*, Fabricius.

**Mycalesis mineus*, Linn.

**Ypthima baldus*, Fabricius.

**Ypthima asterope*, Klug.

Ypthima philomela, Joh.

The first of these three is very abundant, but varies remarkably in size, markings and colorations. I am inclined to believe that the latter two are one and the same species.

Discophora celinde, Stoll.

**Junonia lemonias*, Linn.

**Junonia laomedea*, Linn.

**Junonia Wallacei*.

**Junonia hierta*, Fabricius.

Junonia hierta, var. *cebrene*, Trim.

Junonia orithya, Linn.

**Junonia asterie*, Linn.

**Junonia almana*, Linn.

**Precis iphita*.

- **Ergolis ariadne*, Linn.
- **Athyma perius*, Linn.
- Athyma leucothoe*, Linn.
- Athyma sulpitia*, Cram.
- **Athyma kasa*, Moore.
- **Euthalia puseda*.
- **Lethe Europa*, Fabricius.
- **Danais genutia*, Cramer.
- **Danais tytia*, Gray.

This and the foregoing insects attain unusual dimensions in the warm climate of Hongkong. The latter is found also in Japan, but is invariably smaller in size.

- **Danais limniace*, Cramer.
- Danais similis*, Linn.
- **Danais plexippus*, Linn.
- **Catopsilia philippina*, Cramer.
- Catopsilia pyranthe*, Linn.
- **Hebomoia glaucippe*, Linn.
- Hebomoia crocale*, Cramer.
- Ixias pyrene*, Linn.
- **Miletus chinensis*, Felder.

This pretty member of the *Lycænidæ* is said to be confined to Hongkong, but I have taken it in several places on the mainland.

- **Euplœa superbus*, Herbst.
- **Euplœa midamus*, Linn.

The latter is much more frequent than the former. It varies remarkably in size; more so, perhaps, than any other butterfly haunting the gardens of Hongkong.

- **Hesperia flava*, Murray.

Common throughout China and Japan.

- **Pamphila mathias*, Fabr.
- Pamphila maro*, Fabr.
- Plesioneura folus*, Cramer.
- Hipparchia eumea*, Drury.

I have, in the foregoing list, not made any attempt at correct classification. The field, so far as the province of Kwangtung, or indeed southern China, is concerned, is a virgin one. Much remains still to be done, as the greater part of those who collect, or have collected, in Southern China, have neglected to give careful data as to the localities, seasons, etc. By far the most important part of the little work hitherto done is thus untrustworthy or often downright misleading.

The following list of moths includes merely the most important species; from personal observation I believe that more than three hundred species can be identified as coming from Hongkong:—

<i>Chærocampa suffusa</i> , Walker.	* <i>Lælia sinensis</i> , Walker.
* <i>Chærocampa palli-costæ</i> , Walker.	<i>Pantana ampla</i> , Walker.
* <i>Acherontia medusa</i> , Butler.	* <i>Acontia bimacula</i> , Walker.
<i>Diludia discistriga</i> , Walker.	(<i>Acontia maculosa</i> ?)
* <i>Diludia incerta</i> , Walker.	* <i>Boarmia repulsaria</i> , Walker.
<i>Northia tenuis</i> , Butler.	—————
* <i>Phissama vacillans</i> , Walker.	* <i>Ophiura aretotaenia</i> .
<i>Spilarctia subcarnea</i> , Walker.	* <i>Tropæa artemis</i> , Butler.

In conclusion, it is necessary to state that the list of butterflies is by no means exhaustive. There are some five or six doubtful species which the writer has thought best not to include; and, besides these, there are one or two others that may, very probably, turn out to be *species novæ*.